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SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT:

(A) NAME: Federal Republic of Germany, finally represented by
the President of the Paul-Ehrlich-Institute
(B) STREET: Paul-Ehrlich-Str. 51-59
(C) CITY: Langen
(E) COUNTRY: Germany
(F) POSTAL CODE (ZIP): 63225

(ii) TITLE OF INVENTION: CELL-SPECIFIC RETROVIRAL VECTORS WITH
ANTIBODY DOMAINS AND METHOD FOR THE PRODUCTION THEREOF FOR SELECTIVE GENE
TRANSFER

(iii) NUMBER OF SEQUENCES: 32

(iv) COMPUTER-READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: Patent In Release #1.0, Version #1.30 (EPA)

(v) PRIOR APPLICATION DATA:

APPLICATION NUMBER: DE 197 52 854.6
DATE OF APPLICATION: 28-11-1997

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 4776 Base pairs
(B) TYPE: Nucleotide
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(iii) HYPOTHETICAL: NO

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

GAATTCCTCGT ACGAGCCATA GATAAAATAA AAGATTTTAT TTAGTCTCCA GAAAAAGGGG 60
GGAATGAAAG ACCCCACCTG TAGGTTTGGC AAGCTAGCTT AAGTAACGCC ATTTTGCAAG 120
GCATGGAAAA ATACATAACT GAGAATAGAG AAGTTCAGAT CAAGGTCAGG AACAGATGGA 180
ACAGCTGAAT ATGGGCCCCA CAGGATATCT GTGGTAAGCA GTTCCTGCCC CGGCTCAGGG 240
CCAAGAACAG ATGGAACAGC TGAATATGGG CCAAACAGGA TATCTGTGGT AAGCAGTTCC 300
TGCCCCGGCT CAGGGCCAAG AACAGATGGT CCCCAGATGC GGTCCAGCCC TCAGCAGTTT 360
CTAGAGAACC ATCAGATGTT TCCAGGGTGC CCCAAGGACC TGAAATGACC CTGTGCCTTA 420
TTTGAATAA CCAATCAGTT CGCTTCTCGC TTCTGTTTCGC GCGCTTCTGC TCCCCGAGCT 480
CAATAAAAGA GCCCACAACC CCTCACTCGG GCGCCAGTC CTCCGATTGA CTGAGTCGCC 540
CGGGTGGGGG AGCTCGCTGT TGGGCTCGCG GTTGAGGACA AACTCTTCGC GGTCTTTCCA 600
GTA CTCTTGG ATCGGAAACC CGTCGGCCTC CGAACGGTAC TCCGCCACCG AGGGACCTGA 660

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GCGAGTCCGC ATCGACCGGA TCGGAAAACC TCTCGAGAAA GCGGTCTAAC CAGTCACAGT 720
CGCAAGGTAG GCTGAGCACC GTGGCCGGGC GGCACGGGTG GCGGTGCGGG TTGTTTCTGG 780
CGGAGGTGCT GCTGATGATG TAATTAAGTA GGCGGTCTTG AGACGGCGAT GGTGAGGTG 840
AGGTGTGGCA GGCTTGAGAT CTGGCCATAC ACTTGAGTGA CAATGACATC CACTTTGCCT 900
TTCTCTCCAC AGGTGTCCAC TCCCAGGTCC AACCGGATCC GAGCTCCACC GCGGTAAAGG 960
TCGCTGGGAA GACCCCGTGG ATCCACCACT CTCGACTCAA GAAAGCTCCT GACAACCAAG 1020
AAGAATGGAC TGTCTACCA ACCTCCGATC CGCTGAGGGT AAAGTTGACC AGGCGAGCAA 1080
AATCCTAATT CTCCTTGTGG CTTGGTGGGG GTTTGGGACC ACTGCCGAAG TTTGACTGC 1140
CGGCTCCGGG GGCGGTGGTT CTGGTGGTGG TTCTGGTGGT GGTGTTCTG GTGGTGGTGG 1200
TTCTGGCGCC AGCCCAGTCC AGTTTATCCC CCTGCTTGTG GGTCTAGGGA TTTCAGGGGC 1260
TACACTTGCT GGTGGAACGG GGCTTGGGGT CTCGGTTCAC ACTTATCACA AGCTCTCTAA 1320
TCAATTGATT GAAGATGTCC AGGCTCTTTC AGGGACCATC AATGACCTAC AGGACCAGAT 1380
TGAATCCCTG GCTGAGGTG TCTTACAAA TAGAAGAGGG TTAGACCTAT TGAATGCCGA 1440
ACAAGGAGGA ATATGTCTCG CACTCCAGGA GAAGTGTGT TTTACGCTA ACAAGTCGGG 1500
TATCGTACGT GACAAGATCC GAAAACTCCA AGAGGACCTT ATCGAGAGAA AACGTGCACT 1560
GTACGACAAC CCCCTGTGGA GCGGCTTGAA CGGCTTCCTT CCATATTTGC TACCCTTGTT 1620
AGGCCCCCTG TTTGGGCTCA TATTGTTCTT GACCCCTCGGC CCGTGCAATTA TGAAGACCCT 1680
GACTCGCATT ATACATGACA AAATTCAGGC AGTAAATCC TAGCACTAGT CCCACAGTAC 1740
AAGCCACTCC CAACAGAGAT GGATACCTA GGGGTCCGAT GGTCTAAGAA TTCTCGAGTC 1800
TAAGATCGAT CGAATTCCTA GGTCAATGAT TTGACCAGAA TGTACAAGAG CAGTGGGGAA 1860
TGTGGGAGGG GCTTACGAAG GCCTTAAGTG ACTAGGTACC CGATCCAGAC ATGATAAGAT 1920
ACATTGATGA GTTGGACAA ACCACAATA GAATGCAGTG AAAAAATGC TTTATTTGTG 1980
AAATTTGTGA TGCTATTGCT TTATTTGTAA CCATTATAAG CTGCAATAAA CAAGTTAACA 2040
ACAACAATTG CATTCAATTT ATGTTTCAGG TTCAGGGGGA GGTGTGGGAG GTTTTTTAAA 2100
GCAAGTAAAA CCTCTACAA TCAAGCTGGG CAAGCTAGAT CTAGCTTGGC GTAATCATGG 2160
TCATAGCTGT TTCCTGTGTG AAATTGTTAT CCGCTCACA TTCCACACAA CATACGAGCC 2220
GGAAGCATAA AGTGTAAGC CTGGGGTGCC TAATGAGTGA GCTAACTCAC ATTAATTGCG 2280
TTGCGCTCAC TGCCCGCTTT CCAGTCGGGA AACCTGTCGT GCCAGCTGCA TTAATGAATC 2340
GGCCAACGCG CGGGGAGAGG CGGTTTGCCT ATTGGGCGCT CTCCGCTTC CTCGCTCACT 2400
GACTCGCTGC GCTCGGTCTG TCGGCTGCGG CGAGCGGTAT CAGCTCACTC AAAGGCGGTA 2460
ATACGGTTAT CCACAGAATC AGGGGATAAC GCAGGAAAGA ACATGTGAGC AAAAGGCCAG 2520
CAAAAGGCCA GGAACCGTAA AAAGGCCGCG TTGCTGGCGT TTTTCCATAG GCTCCGCCCC 2580

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CCTGACGAGC ATCACAAAAA TCGACGCTCA AGTCAGAGGT GCGGAAACCC GACAGGACTA 2640
TAAAGATACC AGGCGTTTCC CCCTGGAAGC TCCCTCGTGC GCTCTCCTGT TCCGACCCCTG 2700
CCGCTTACCG GATACCTGTC CGCCTTTCTC CCTTCGGGAA GCGTGGCGCT TTCTCAATGC 2760
TCACGCTGTA GGTATCTCAG TTCGGTGTAG GTCGTTGCT CCAAGCTGGG CTGTGTGCAC 2820
GAACCCCCCG TTCAGCCCGA CCGCTGCGCC TTATCCGGTA ACTATCGTCT TGAGTCCAAC 2880
CCGGTAAGAC ACGACTTATC GCCACTGGCA GCAGCCACTG GTAACAGGAT TAGCAGAGCG 2940
AGGTATGTAG GCGGTGCTAC AGAGTTCTTG AAGTGGTGGC CTAACACGG CTACACTAGA 3000
AGGACAGTAT TTGGTATCTG CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGGT 3060
AGCTCTTGAT CCGGCAAACA AACCACCGCT GGTAGCGGTG GTTTTTTTGT TTGCAAGCAG 3120
CAGATTACGC GCAGAAAAAA AGGATCTCAA GAAGATCCTT TGATCTTTTC TACGGGGTCT 3180
GACGCTCAGT GGAACGAAAA CTCACGTAA GGGATTTTGG TCATGAGATT ATCAAAAAGG 3240
ATCTTCACCT AGATCCTTTT AAATTAATAA TGAAGTTTTA AATCAATCTA AAGTATATAT 3300
GAGTAAACTT GGTCTGACAG TTACCAATGC TTAATCAGTG AGGCACCTAT CTCAGCGATC 3360
TGTCTATTTT GTTCATCCAT AGTTGCCTGA CTCCCCGTG TGTAGATAAC TACGATACGG 3420
GAGGGCTTAC CATCTGGCCC CAGTGCTGCA ATGATACCGC GAGACCCACG CTCACCGGCT 3480
CCAGATTTAT CAGCAATAAA CCAGCCAGCC GGAAGGGCCG AGCGCAGAAG TGGTCCTGCA 3540
ACTTTATCCG CCTCCATCCA GTCTATTAAT TGTTGCCGGG AAGCTAGAGT AAGTAGTTCTG 3600
CCAGTTAATA GTTTGCGCAA CGTTGTTGCC ATTGCTACAG GCATCGTGGT GTCACGCTCG 3660
TCGTTTGSTA TGGCTTCATT CAGCTCCGGT TCCCAACGAT CAAGGCGAGT TACATGATCC 3720
CCCATGTTGT GCAAAAAAGC GGTTAGCTCC TTCGGTCTC CGATCGTTGT CAGAAGTAAG 3780
TTGGCCGCAG TGTTATCACT CATGGTTATG GCAGCACTGC ATAATTCTCT TACTGTCTATG 3840
CCATCCGTAA GATGCTTTTC TGTGACTGGT GAGTACTCAA CCAAGTCATT CTGAGAAATAG 3900
TGTATGCGGC GACCGAGTTG CTCTTGCCCG GCGTCAATAC GGGATAATAC CGCGCCACAT 3960
AGCAGAACTT TAAAAGTGCT CATCATTTGA AAACGTTCTT CGGGGCGAAA ACTCTCAAGG 4020
ATCTTACCGC TGTTGAGATC CAGTTGATG TAACCCACTC GTGCACCCAA CTGATCTTCA 4080
GCATCTTTTA CTTTCACCAG CGTTTCTGGG TGAGCAAAAA CAGGAAGGCA AAATGCCGCA 4140
AAAAAGGGAA TAAGGGCGAC ACGGAAATGT TGAATACTCA TACTCTTCCT TTTCAATAT 4200
TATTGAAGCA TTTATCAGGG TTATTGTCTC ATGAGCGGAT ACATATTGA ATGTATTAG 4260
AAAAATAAAC AAATAGGGGT TCCGCGCACA TTTCCCCGAA AAGTGCCACC TGACGTCTAA 4320
GAAACCATTA TTATCATGAC ATTAACCTAT AAAAATAGGC GTATCACGAG GCCCTTTCGT 4380
CTCGCGCGTT TCGGTGATGA CGGTGAAAAC CTCTGACACA TGCAGCTCCC GGAGACGGTC 4440
ACAGCTTGTC TGTAAGCGGA TGCCGGGAGC AGACAAGCCC GTCAGGGCGC GTCAGCGGGT 4500
GTTGGCGGGT GTCGGGGCTG GCTTAACTAT GCGGCATCAG AGCAGATTGT ACTGAGAGTG 4560

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CACCATATGC	GGTGTGAAAT	ACCGCACAGA	TGCGTAAGGA	GAAAATACCG	CATCAGGCGC	4620
CATTCCGCAT	TCAGGCTGCG	CAACTGTTGG	GAAGGGCGAT	CGGTGCGGGC	CTCTTGCTA	4680
TTACGCCAGC	TGGCGAAAGG	GGGATGTGCT	GCAAGGCGAT	TAAGTTGGGT	AACGCCAGGG	4740
TTTTCCCAGT	CACGACGTTG	TAAAACGACG	GCCAGT			4776

(2) INFORMATION FOR SEQ ID NO: 2:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 12 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Met Lys Asp Pro Thr Cys Arg Phe Gly Lys Leu Ala
5 10

(2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3;

Met Glu Lys Tyr Ile Thr Glu Asn Arg Glu Val Gln Ile Lys Val Arg
5 10 15

Asn Arg Trp Asn Ser
20

(2) INFORMATION FOR SEQ ID NO: 4:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 8 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:
 Met Gly Gln Thr Gly Tyr Leu Trp
 5

Met Gly Gln Thr Gly Tyr Leu Trp
5

(2) INFORMATION FOR SEQ ID NO: 5:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 13 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:
 Met Glu Gln Leu Asn Met Gly Gln Thr Gly Tyr Leu Trp
 5 10

Met Glu Gln Leu Asn Met Gly Gln Thr Gly Tyr Leu Trp
5 10

(2) INFORMATION FOR SEQ ID NO: 6:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 12 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:
 Met Val Pro Arg Cys Gly Pro Ala Leu Ser Ser Phe

Met Val Pro Arg Cys Gly Pro Ala Leu Ser Ser Phe

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(2) INFORMATION FOR SEQ ID NO: 7:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Phe Pro Gly Cys Pro Lys Asp Leu Lys
5 10

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 15 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Met Val Glu Val Arg Cys Gly Arg Leu Glu Ile Trp Pro Tyr Thr
5 10 15

(2) INFORMATION FOR SEQ ID NO: 9:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

Met Thr Ser Thr Leu Pro Phe Ser Pro Gln Val Ser Thr Pro Arg Ser
5 10 15
Asn Arg Ile Arg Ala Pro Pro Arg
20

(2) INFORMATION FOR SEQ ID NO: 10:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 232 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

Met Asp Cys Leu Thr Asn Leu Arg Ser Ala Glu Gly Lys Val Asp Gln
5 10 15
Ala Ser Lys Ile Leu Ile Leu Leu Val Ala Trp Trp Gly Phe Gly Thr
20 25 30
Thr Ala Glu Val Ser Thr Ala Gly Ser Gly Gly Gly Ser Gly Gly
35 40 45
Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Ala Ser Pro
50 55 60
Val Gln Phe Ile Pro Leu Leu Val Gly Leu Gly Ile Ser Gly Ala Thr
65 70 75 80
Leu Ala Gly Gly Thr Gly Leu Gly Val Ser Val His Thr Tyr His Lys
85 90 95
Leu Ser Asn Gln Leu Ile Glu Asp Val Gln Ala Leu Ser Gly Thr Ile
100 105 110
Asn Asp Leu Gln Asp Gln Ile Asp Ser Leu Ala Glu Val Val Leu Gln
115 120 125
Asn Arg Arg Gly Leu Asp Leu Leu Thr Ala Glu Gln Gly Gly Ile Cys
130 135 140
Leu Ala Leu Gln Glu Lys Cys Cys Phe Tyr Ala Asn Lys Ser Gly Ile
145 150 155 160
Val Arg Asp Lys Ile Arg Lys Leu Gln Glu Asp Leu Ile Glu Arg Lys
165 170 175

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Arg Ala Leu Tyr Asp Asn Pro Leu Trp Ser Gly Leu Asn Gly Phe Leu
 180 185 190
 Pro Tyr Leu Leu Pro Leu Leu Gly Pro Leu Phe Gly Leu Ile Leu Phe
 195 200 205
 Leu Thr Leu Gly Pro Cys Ile Met Lys Thr Leu Thr Arg Ile Ile His
 210 215 220
 Asp Lys Ile Gln Ala Val Lys Ser
 225 230

(2) INFORMATION FOR SEQ ID NO: 11:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

Met Asp Thr Leu Gly Val Arg Trp Ser Lys Asn Ser Arg Val
 5 10

(2) INFORMATION FOR SEQ ID NO: 12:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 15 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

Met Tyr Lys Ser Ser Gly Glu Cys Gly Arg Gly Leu Arg Arg Pro
 5 10 15

(2) INFORMATION FOR SEQ ID NO: 13:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

Met Ile Arg Tyr Ile Asp Glu Phe Gly Gln Thr Thr Thr Arg Met Gln
 5 10 15

(2) INFORMATION FOR SEQ ID NO: 14:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 4 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

Met Leu Tyr Leu

(2) INFORMATION FOR SEQ ID NO: 15:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

Met Leu Leu Leu Tyr Leu
 5

(2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: Protein
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:
Met Phe Gln Val Gln Gly Glu Val Trp Glu Val Phe
5 10

(2) INFORMATION FOR SEQ ID NO: 17:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 26 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

Met Val Ile Ala Val Ser Cys Val Lys Leu Leu Ser Ala His Asn Ser
5 10 15
Thr Gln His Thr Ser Arg Lys His Lys Val
20 25

(2) INFORMATION FOR SEQ ID NO: 18:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 49 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO. 18:

Met	Ser	Glu	Leu	Thr ⁵	His	Ile	Asn	Cys	Val ¹⁰	/	Ala	Leu	Thr	Ala	Arg ¹⁵	Phe
Pro	Val	Gly	Lys ²⁰	Pro	Val	Val	Pro	Ala ²⁵	Ala	/	Leu	Met	Asn	Arg ³⁰	Pro	Thr
Arg	Gly	Glu ³⁵	Arg	Arg	Phe	Ala	Tyr ⁴⁰	Trp	Ala	/	Leu	Phe	Arg ⁴⁵	Phe	Leu	Ala
His										/						

(2) INFORMATION FOR SEQ ID NO: 19:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 4 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

Met Leu Thr Leu

(2) INFORMATION FOR SEQ ID NO: 20:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 Amino acids

(B) TYPE: Amino acid/

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

Met Arg Leu Ser Lys Arg Ile Phe Thr
5

(2) INFORMATION FOR SEQ ID NO: 21:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 Amino acids

(B) TYPE: Amino/acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

Met Ser Lys Leu Gly Leu Thr Val Thr Asn Ala
5 10

(2) INFORMATION FOR SEQ ID NO: 23:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 88 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

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Met Ile Pro Arg Asp Pro Arg Ser Pro Ala Pro Asp Leu Ser Ala Ile
      5              10              15
Asn Gln Pro Ala Gly Arg Ala Glu Arg Arg Ser Gly Pro Ala Thr Leu
      20              25              30
Ser Ala Ser Ile Gln Ser Ile Asn Cys Cys Arg Glu Ala Arg Val Ser
      35              40              45
Ser Ser Pro Val Asn Ser Leu Arg Asn Val Val Ala Ile Ala Thr Gly
      50              55              60
Ile Val Val Ser Arg Ser Ser Phe Gly Met Ala Ser Phe Ser Ser Gly
      65              70              75              80
Ser Gln Arg Ser Arg Arg Val Thr
      85

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(2) INFORMATION FOR SEQ ID NO: 24:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 56 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

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Met Leu Cys Lys Lys Ala Val Ser Ser Phe Gly Pro Pro Ile Val Val
      5              10              15
Arg Ser Lys Leu Ala Ala Val Leu Ser Leu Met Val Met Ala Ala Leu
      20              25              30
His Asn Ser Leu Thr Val Met Pro Ser Val Arg Cys Phe Ser Val Thr
      35              40              45
Gly Glu Tyr Ser Thr Lys Ser Phe
      50              55

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(2) INFORMATION FOR SEQ ID NO: 25:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 49 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

```

Met Arg Arg Pro Ser Cys Ser Cys Pro Ala Ser Ile Arg Asp Asn Thr
      5              10              15
Ala Pro His Ser Arg Thr Leu Lys Val Leu Ile Ile Gly Lys Arg Ser
      20              25              30
Ser Gly Arg Lys Leu Ser Arg Ile Leu Pro Leu Leu Arg Ser Ser Ser
      35              40              45
Met

```

(2) INFORMATION FOR SEQ ID NO: 26:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 Amino acids

(B) TYPE: Amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

```

Met Pro Gln Lys Arg Glu
      5

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(2) INFORMATION FOR SEQ ID NO: 27:

(i) SEQUENCE CHARACTERISTICS:

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- (A) LENGTH: 27 Amino acids
(B) TYPE: Amino acid
(D) TOPOLOGY: linear
(ii) MOLECULE TYPE: Protein
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27;

Met Leu Asn Thr His Thr Leu Pro Phe Ser Ile Leu Leu Lys His Leu
5 10
Ser Gly Leu Leu Ser His Glu Arg Ile His Ile
20 25 15

- (2) INFORMATION FOR SEQ ID NO: 28:
 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 5 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

Met Tyr Leu Glu Lys
5

- (2) INFORMATION FOR SEQ ID NO: 29:
 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

Met	Thr	Leu	Thr	Tyr	Lys	Asn	Arg	Arg	Ile	Thr	Arg	Pro	Phe	Arg	Leu
				5					10					15	
Ala	Arg	Phe	Gly	Asp	Asp	Gly	Glu	Asn	Leu						
			20				25								

- (2) INFORMATION FOR SEQ ID NO: 30:
 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 11 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

Met Gln Leu Pro Glu Thr / Val Thr Ala Cys Leu
5 10

- (2) INFORMATION FOR SEQ ID NO: 31:
 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear
 (ii) MOLECULE TYPE: Protein
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

Met Pro Gly Ala Asp / Lys Pro Val Arg Ala Arg Gln Arg Val Leu Ala
5 10 15
Gly Val Gly Ala Gly Leu Thr Met Arg His Gln Ser Arg Leu Tyr
20 25 30

- (2) INFORMATION FOR SEQ ID NO:32:
 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 65 Amino acids
 (B) TYPE: Amino acid
 (D) TOPOLOGY: linear

[illegible]

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(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

Met Arg Cys Glu Ile Pro His Arg Cys Val Arg Arg Lys Tyr Arg Ile
 5 10 15
Arg Arg His Ser Pro Phe Arg Leu Arg Asn Cys Trp Glu Gly Arg Ser
 20 25 30
Val Arg Ala Ser Ser Leu Leu Arg Gln Leu Ala Lys Gly Gly Cys Ala
 35 40 45
Ala Arg Arg Leu Ser Trp Val Thr Pro Gly Phe Ser Gln Ser Arg Arg
 45 50 55
Cys Lys Thr Thr Ala Ser
60 65

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